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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SUSAN G. YAN
and JOHN C. DOYLE

Appeal 2009-005147
Application 10/763,633
Technology Center 1700

Before BRADLEY R. GARRIS, ADRIENE LEPIANE HANLON, and
CHARLES F. WARREN, *Administrative Patent Judges*.

Opinion concurring-in-part and dissenting-in-part filed by *Administrative
Patent Judge* WARREN.

HANLON, *Administrative Patent Judge*.

DECISION ON APPEAL¹

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the “MAIL DATE” (paper delivery mode) or the “NOTIFICATION DATE” (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

A. STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134 from an Examiner's decision finally rejecting claims 1, 2, 5-8, 10-14, and 21-29. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM-IN-PART.

The subject matter on appeal relates to a method for fabricating a membrane electrode assembly (MEA). Claims 1, 13, and 21 are illustrative.

1. A method for fabricating a membrane electrode assembly (MEA), said method comprising:

providing a proton conducting membrane in its protonated form having a first side and a second side;

spraying a catalyst ink on the first side of the membrane to deposit a catalyst layer of a cathode or an anode of the MEA; and

clamping the membrane in a clamp to prevent the membrane from wrinkling as a result of the wetness of the catalyst ink on the membrane.

13. A method for fabricating a membrane electrode assembly (MEA), said method comprising:

providing a proton conducting membrane in its protonated form;

spraying a catalyst ink on the membrane to deposit a catalyst layer of a cathode or an anode of the MEA, wherein spraying the catalyst ink includes spraying the ink over several passes to deposit the ink on the membrane to the desired thickness; and

drying the MEA under a heat lamp as the catalyst ink is being sprayed during the several passes to dry the catalyst layer.

21. A method for fabricating a membrane electrode assembly (MEA), said method comprising:

providing a proton conducting membrane in its protonated form having a first side and a second side; and

spraying a catalyst ink on the first side of the membrane to deposit a catalyst layer of a cathode or an anode of the MEA, *wherein the catalyst ink includes a catalyst, solvent and an ionomer having a concentration that is about half of the ionomer concentration of the catalyst as a ratio of ionomer to carbon in a final cathode or anode of the MEA.*

App. Br., Claims Appendix (emphasis added).²

The following Examiner's rejections are before us on appeal:

- (1) Claims 8 and 21-29 are rejected under 35 U.S.C. § 112, second paragraph.
- (2) Claims 8 and 21-29 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.
- (3) Claims 1, 2, 5-8, 10, 11, 13, 14, and 21-29 are rejected under 35 U.S.C. § 103(a) as unpatentable over Starz.³
- (4) Claims 2, 6, 12-14, 22-24, and 29 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Starz and Swathirajan.⁴
- (5) Claims 5, 12, 13, 23, and 29 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Starz and Grot.⁵

² Appeal Brief dated December 10, 2007.

³ US 2002/0034675 A1 published March 21, 2002.

⁴ US 6,277,513 B1 issued August 21, 2001.

B. ISSUES

(1) Did the Examiner reversibly err in concluding that the clamping step recited in claim 1 would have been obvious to one of ordinary skill in the art in view of Starz?

(2) Did the Examiner reversibly err in concluding that the drying step recited in claim 13 would have been obvious to one of ordinary skill in the art in view of Starz either alone or in combination with Swathirajan or Grot?

(3) Did the Examiner reversibly err in concluding that the following language in claims 8 and 21 is indefinite: “an ionomer having a concentration that is about half of the ionomer concentration of the catalyst”?

(4) Did the Examiner reversibly err in concluding that the method recited in claim 21 would have been obvious to one of ordinary skill in the art in view of Starz?

(5) Did the Examiner reversibly err in finding that the original disclosure does not provide written description support for the following language in claims 8 and 21: “an ionomer having a concentration that is about half of the ionomer concentration of the catalyst”?

C. DISCUSSION

1. Issue (1)

The Examiner finds that Starz discloses a method for making a membrane electrode assembly. The Examiner finds that the sole difference

⁵ US 5,330,860 issued July 19, 1994.

between the method recited in claim 1 and the method disclosed in Starz is that Starz does not disclose the claimed clamping step. Ans. 5.⁶

The Examiner contends:

It would be obvious to one of ordinary skill in the art to use a clamp to hold the membrane in the process of making an MEA. Furthermore, applicant admits on page 8 of the arguments that “One of ordinary skill in the art would readily recognize what type of clamp would be needed for this purpose...”

Ans. 5.

The Examiner also contends:

Since the clamp is well known in the art and the method of using the clamp is well known, it would be obvious to one skilled in the art to use a known tool for its known and intended purpose (i.e., a clamp for holding a membrane used to hold a membrane).

Ans. 8.

The Appellants argue that the Examiner has not established a prima facie case because the Examiner has not pointed to any teaching in the references of clamping or holding a membrane during a spraying process. The Appellants argue that their statement “is not an admission that clamping a membrane in a spraying process is obvious, but that if one of ordinary skill has the teaching that the membrane can be clamped, the specific type of clamp used for such purpose would be recognized by those skilled in the art.” App. Br. 4.

The Appellants’ argument is supported by the record. The Examiner has failed to demonstrate, in the first instance, why one of ordinary skill in

⁶ Examiner’s Answer dated March 18, 2008.

the art would have found the claimed clamping step to be useful in the process of Starz. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 424 (2007) (the proper question to have asked was whether one of ordinary skill in the art would have seen a benefit to upgrading Asano with a sensor). The mere fact that clamps were known at the time of the Appellants' invention does not suffice. *See In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness). For this reason, the § 103(a) rejection of claim 1 will be reversed.

Claims 2, 5-8, and 10-12 depend from claim 1. The Examiner has failed to demonstrate that Swathirajan or Grot cure the deficiencies of Starz. Therefore, the § 103(a) rejections of these claims will also be reversed.

2. Issue (2)

Claim 13 recites the step of “drying the MEA under a heat lamp as the catalyst ink is being sprayed during the several passes to dry the catalyst layer.” App. Br., Claims Appendix.

The Examiner finds that Starz uses a circulating air oven, rather than a heat lamp as claimed, to dry the membrane. Ans. 6. The Examiner also finds that Swathirajan and Grot both use a heat lamp to dry a catalyst layer deposited on a membrane. Ans. 6, 7. Based on these findings, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to use a heat lamp to dry the membrane of Starz. Ans. 6. The Examiner also concludes that it would have been obvious to one of ordinary skill in the art “to combine the spraying and drying step to quicken the process of making a membrane.” Ans. 6-7.

The Appellants argue that Starz, either alone or in combination with Swathirajan or Grot, does not disclose or suggest the step of spraying a catalyst ink on a membrane *at the same time* the membrane is dried under a heat lamp. App. Br. 5, 9.

In response, the Examiner contends that claim 13 is not limited to simultaneous spraying and drying. Ans. 9, 10-11.

The Examiner's interpretation of claim 13 is not supported by the language of claim 13. In particular, claim 13 recites that the MEA is dried "under a heat lamp *as the catalyst ink is being sprayed* during the several passes to dry the catalyst layer." App. Br., Claims Appendix (emphasis added); *see also* Spec., [0026] ("According to one embodiment, the catalyst ink 18 is sprayed onto the membrane 14 over several spraying passes under the lamp 30 until the catalyst layer 12 is the desired thickness."). Thus, we interpret claim 13 as reciting that spraying and drying occur at the same time.

To the extent that the Examiner is contending that it would have been obvious to spray and dry at the same time "to quicken the process of making a membrane," the Examiner has failed to direct us to any evidence demonstrating that simultaneous spraying and drying would quicken the method of making the membrane disclosed in Starz. *See Kahn*, 441 F.3d at 988 (there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness).

For the reasons set forth above, the Examiner's § 103(a) rejections of claim 13 will be reversed. Claim 14 depends from claim 13. The Examiner has failed to demonstrate that Swathirajan cures the deficiencies of Starz. Therefore, the § 103(a) rejections of claim 14 will also be reversed.

3. Issue (3)

The Examiner contends that the following language in claims 8 and 21 is indefinite: “an ionomer having a concentration that is about half of the ionomer concentration of the catalyst as a ratio of ionomer to carbon in a final cathode or anode of the MEA.” Ans. 3. According to the Examiner:

The concentration of ionomer is based as being half of the ionomer concentration of the catalyst and compares this value to a ratio of ionomer to carbon. First, it is unclear what concentration of ionomer a catalyst has since a catalyst is in this case an element, like platinum.

Ans. 4.

The Appellants contend that in the fuel cell art, a combination of materials, such as catalytic particles, carbon particles, and ionomer, is understood to be a catalyst. Therefore, the Appellants contend that one of ordinary skill in the art would recognize that a catalyst for a MEA as claimed is not limited to the specific metal element that causes the chemical reaction. Reply Br. 4-5.⁷

The Appellants’ argument is not supported by the claim language at issue. Claims 8 and 21 recite that “the catalyst ink includes *a catalyst*, solvent and an ionomer.” App. Br., Claims Appendix (emphasis added). Thus, we conclude that “the catalyst” recited in claim 8 refers to the catalyst contained in the catalyst ink. The Appellants disclose that platinum is an example of such a catalyst. Spec., para. [0004].

Based on the foregoing, we agree with the Examiner that “the ionomer concentration of *the catalyst*” is unclear. Likewise, “an ionomer having a concentration that is about half of the ionomer concentration of *the catalyst*”

⁷ Reply Brief dated May 15, 2008.

is also unclear. App. Br., Claims Appendix (emphasis added). For this reason, the § 112, second paragraph, rejection will be affirmed.

4. Issue (4)

The obviousness of claims 21-29 cannot be assessed in view of the indefiniteness of claim 21. Therefore, we decline to reach the Examiner's § 103(a) rejections of claims 21-29.⁸ *Cf. In re Steele*, 305 F.2d 859, 862-63 (CCPA 1962) (reversing obviousness rejection because it was based on speculation as to the meaning of claim terms and assumptions as to claim scope).

5. Issue (5)

The Examiner contends that the original disclosure does not provide written description support for the following language in claims 8 and 21: "the catalyst ink includes a catalyst, solvent and an ionomer having a concentration that is about half of the ionomer concentration of the catalyst as a ratio of ionomer to carbon in a final cathode or anode of the MEA."

Ans. 3. According to the Examiner:

The instant disclosure does not support a concentration of the ionomer being "about half of the ionomer concentration of the catalyst", regardless of the ratio of ionomer to carbon. Based on antecedent basis, "the catalyst" refers back to the catalyst that makes up the ink and the instant specification does not support an ionomer concentration that is compared with this catalyst.

⁸ We did reach the Examiner's § 103(a) rejection of claim 8. However, our reversal of that rejection was not based on the language at issue in the § 112, second paragraph, rejection on appeal. Rather, our reversal was based on language incorporated by reference from independent claim 1, i.e., "clamping the membrane in a clamp to prevent the membrane from wrinkling as a result of the wetness of the catalyst ink on the membrane."

Ans. 3.

In response, the Appellants direct our attention to paragraphs [0016] and [0027]. Reply Br. 2-3. The Appellants argue that these portions of the Specification describe, within the meaning of 35 U.S.C. § 112, that “the catalyst material deposited on the membrane can include about half of the ionomer in the final anode or cathode of the MEA.” Reply Br. 3.

Significantly, claims 8 and 21 do not state that the catalyst ink includes about half of the total ionomer concentration in the final anode or cathode of the MEA. Instead, claims 8 and 21 state that the ionomer in the catalyst ink has a concentration that is “about half of the ionomer concentration of the catalyst.”

The Appellants have failed to explain why their interpretation of the claim language at issue is reasonable based on the record before us. Therefore, the § 112, first paragraph, rejection will be affirmed for the reasons set forth by the Examiner.

D. DECISION

The rejection of claims 8 and 21-29 under 35 U.S.C. § 112, second paragraph, is affirmed.

The rejection of claims 8 and 21-29 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement is affirmed.

The rejection of claims 1, 2, 5-8, 10, 11, 13, and 14 under 35 U.S.C. § 103(a) as unpatentable over Starz is reversed.

The rejection of claims 2, 6, and 12-14 under 35 U.S.C. § 103(a) as unpatentable over the combination of Starz and Swathirajan is reversed.

The rejection of claims 5, 12, and 13 under 35 U.S.C. § 103(a) as unpatentable over the combination of Starz and Grot is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED-IN-PART

Ssl

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WARREN, *Administrative Patent Judge*, concurring-in-part and dissenting-in-part:

I join the majority opinion except in the following respects. First, the majority opinion properly holds that claims 8 and 21-29 are indefinite under 35 U.S.C. § 112, second paragraph, and that “[t]he obviousness of claims 21-29 cannot be assessed in view of the indefiniteness of claim 21,” on which claims 22-29 depend. Dec. 8-9. Thus, the majority opinion in effect reversed pro forma the Examiner’s grounds of rejection of claims 21-29 under 35 U.S.C. § 103(a). Dec. 9. In my view, on this record, it would seem to follow that claim 8 is also indefinite to the extent that the obviousness thereof under § 103(a) cannot be assessed. Instead, the majority assessed the ground of rejection of claim 8 under § 103(a), explaining that the assessment was based on certain language in claim 1 on which claim 8 depends. Dec. 4-6 and fn. 8. It is axiomatic that the obviousness of a claim under 35 U.S.C. § 103(a) is assessed based on consideration of the claimed invention as a whole encompassed by that claim. In my opinion, the claimed invention as a whole encompassed by the language of claim 8 includes not only the limitations of claim 1 but also the limitation specified in claim 8, and indeed, it is the claimed invention encompassed as a whole by claim 8 that is held indefinite. Thus, consideration of only part of claim 8 with respect to a ground of rejection under § 103(a) is inappropriate. Accordingly, I would not have assessed the obviousness of claim 8 under 35 U.S.C. § 103(a).

Second, in my view, it similarly follows that if claims 8 and 21-29 are indefinite to the extent that obviousness under 35 U.S.C. § 103(a) cannot and should not be assessed based on consideration of the claimed invention as a whole encompassed by the claims, then it further cannot be assessed whether

the Specification as filed provides a written description as a matter of fact of the claimed invention as a whole encompassed by these claims under 35 U.S.C. § 112, first paragraph, written description requirement. Dec. 9-10. *See, e.g., In re Moore*, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971) (“Once having determined that the subject matter defined by the claims is particular and definite, the analysis then turns to the first paragraph of section 112 to determine whether the scope of protection sought is supported and justified by the specification disclosure.”); *see also, e.g., Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64 (Fed. Cir. 1991) (“[t]he invention is, for purposes of the ‘written description’ inquiry, *whatever is now claimed*.”); *In re Wertheim*, 541 F.2d 257, 262 (CCPA 1976) (“The function of the description requirement is to ensure that the inventor had possession, as of the filing date of the application relied on, of the specific subject matter later claimed by him.”). Accordingly, in my opinion, because we hold that claims 8 and 21-29 are indefinite under 35 U.S.C. § 112, second paragraph, the invention claimed therein cannot be determined. Thus, whether claims 8 and 21-29 comply with the provisions of § 112, first paragraph, written description requirement cannot be assessed. Thus, I would reverse pro forma the ground of rejection of claims 8 and 21-29 under this statutory provision.